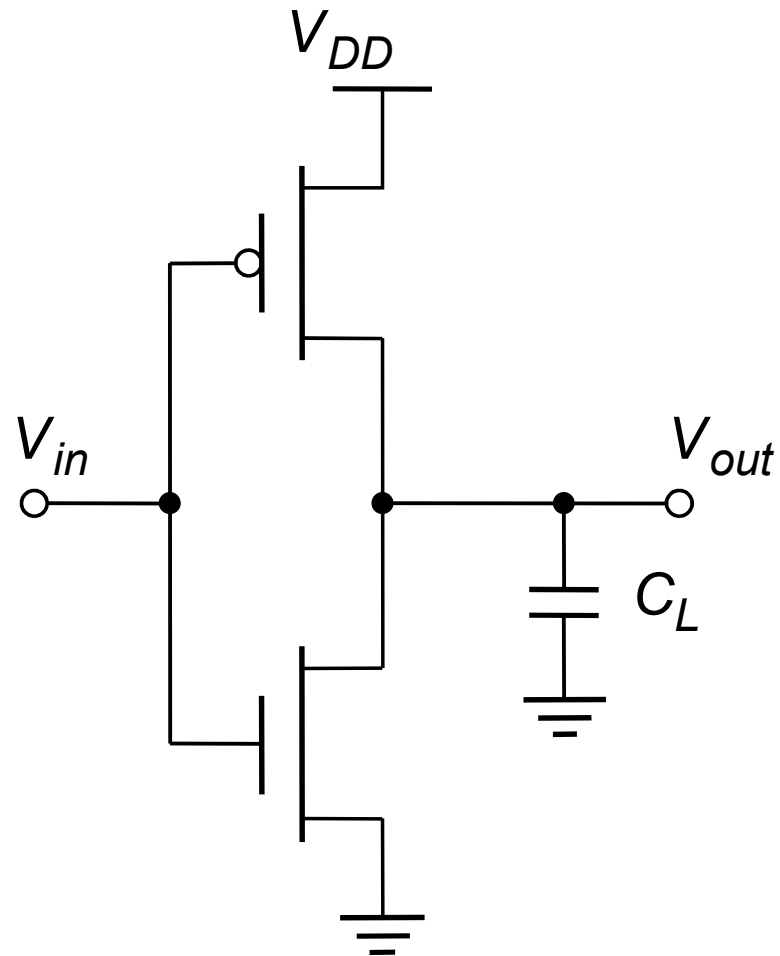
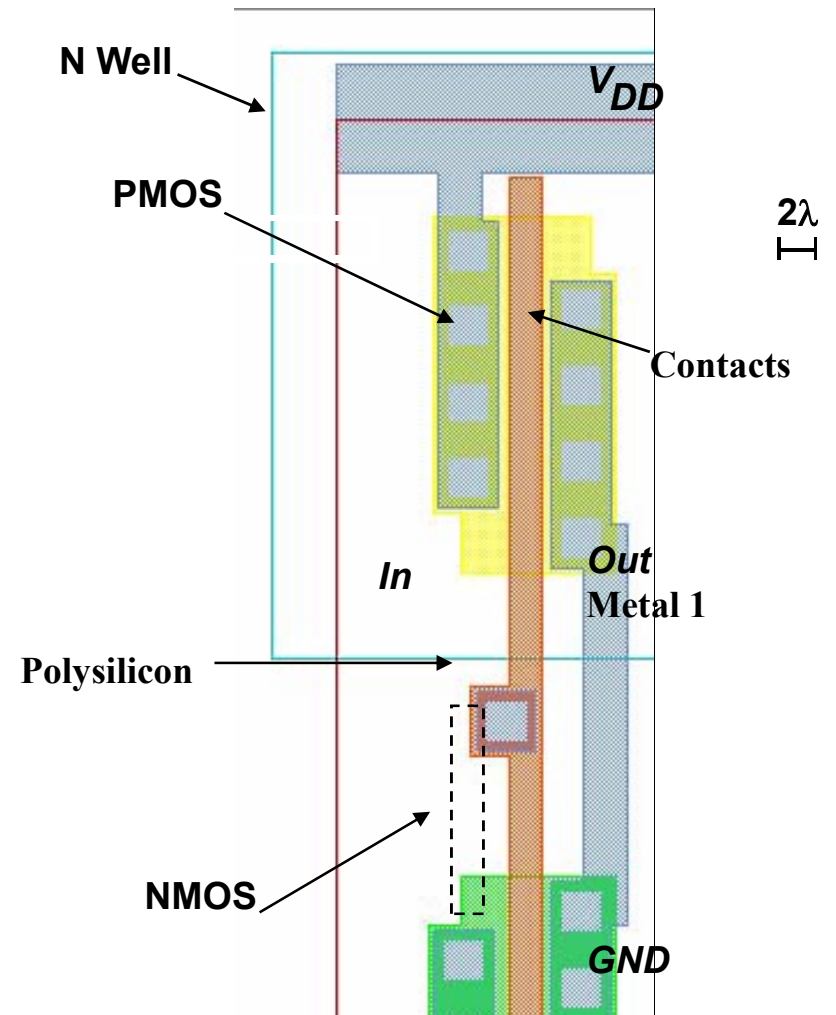
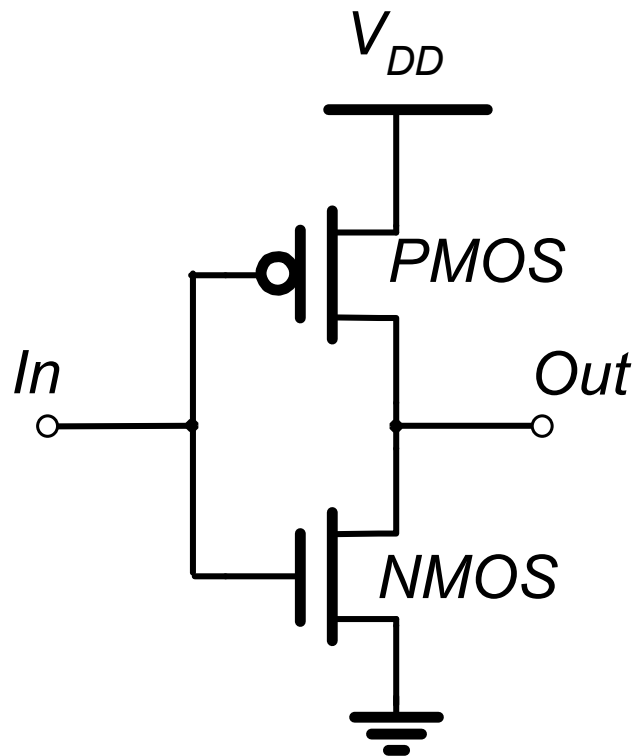


# *The CMOS Inverter: A First Glance*



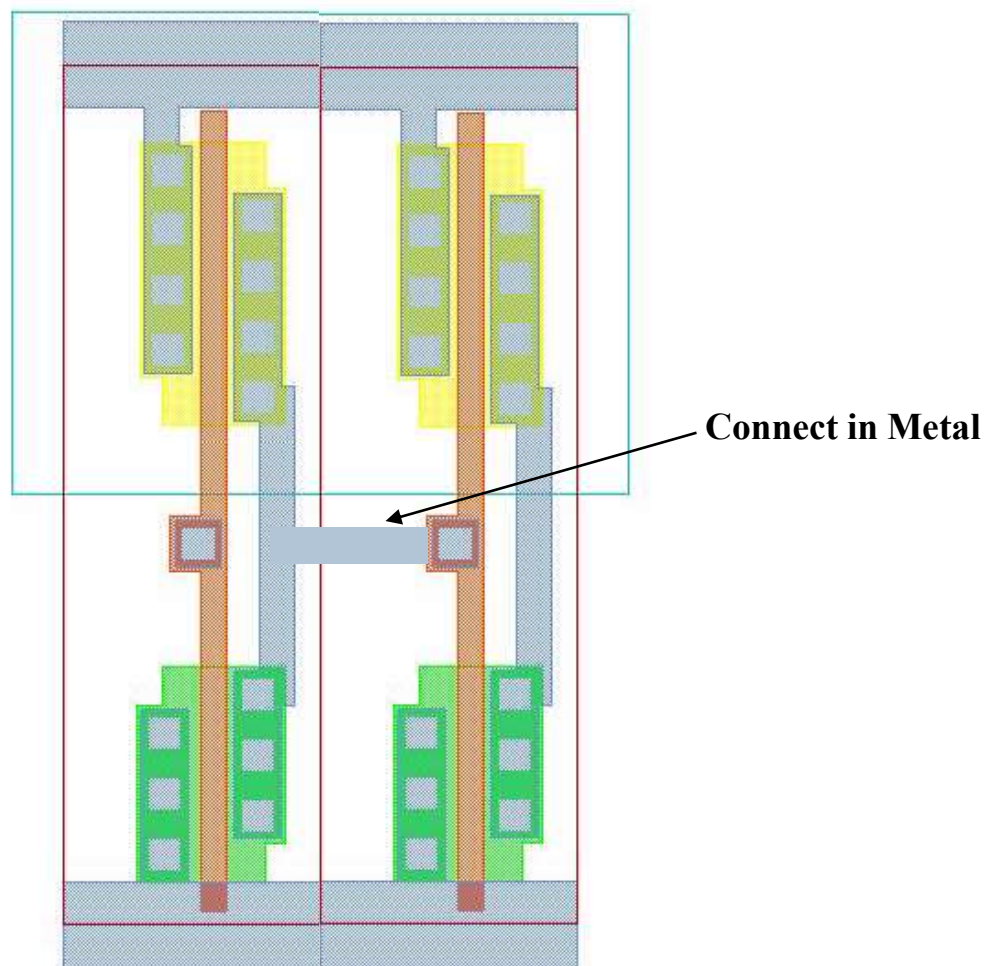
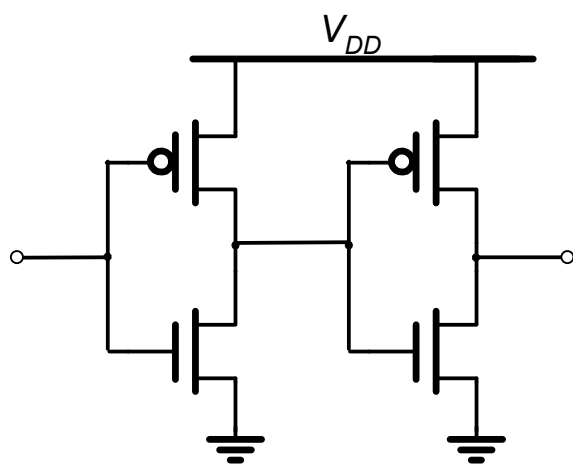
# CMOS Inverter



# Two Inverters

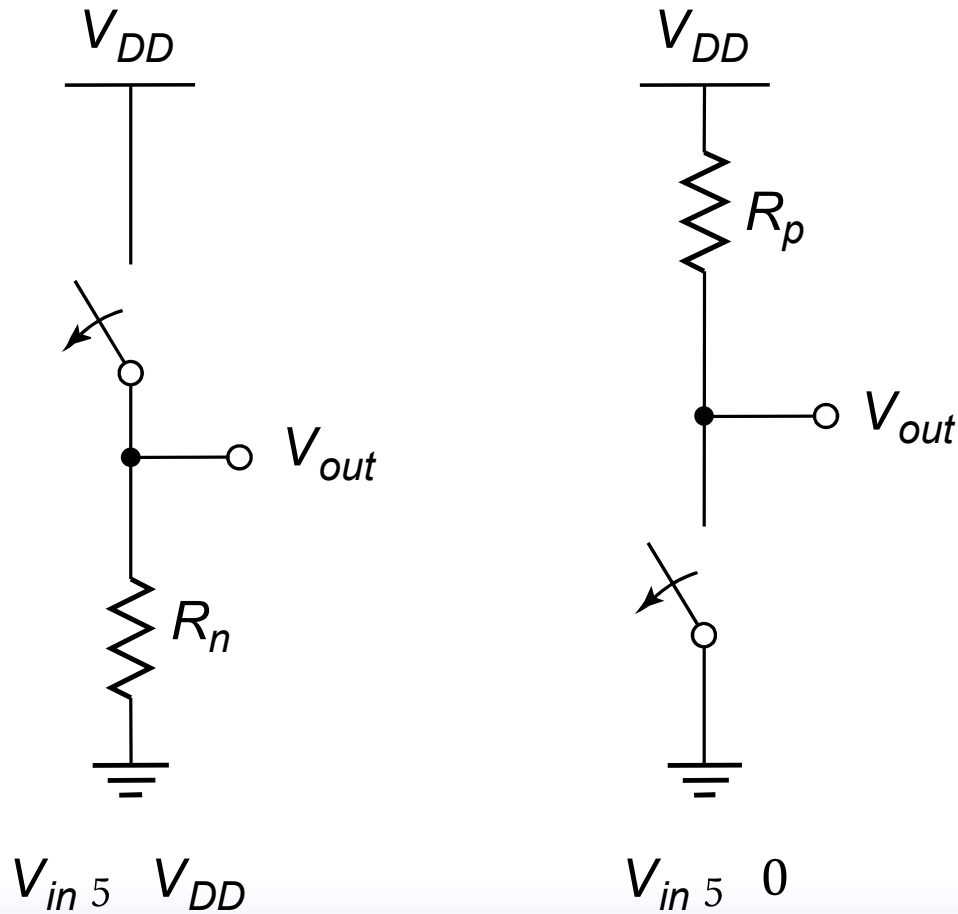
Share power and ground

Abut cells



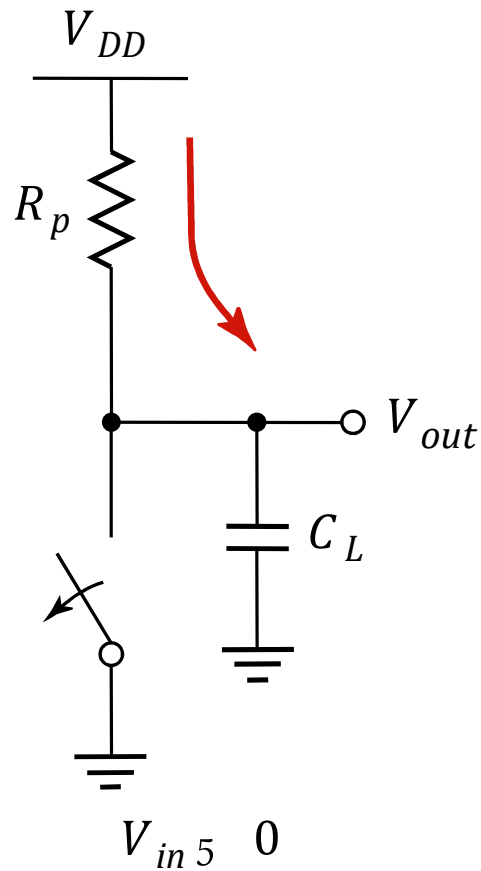
# CMOS Inverter

## First-Order DC Analysis

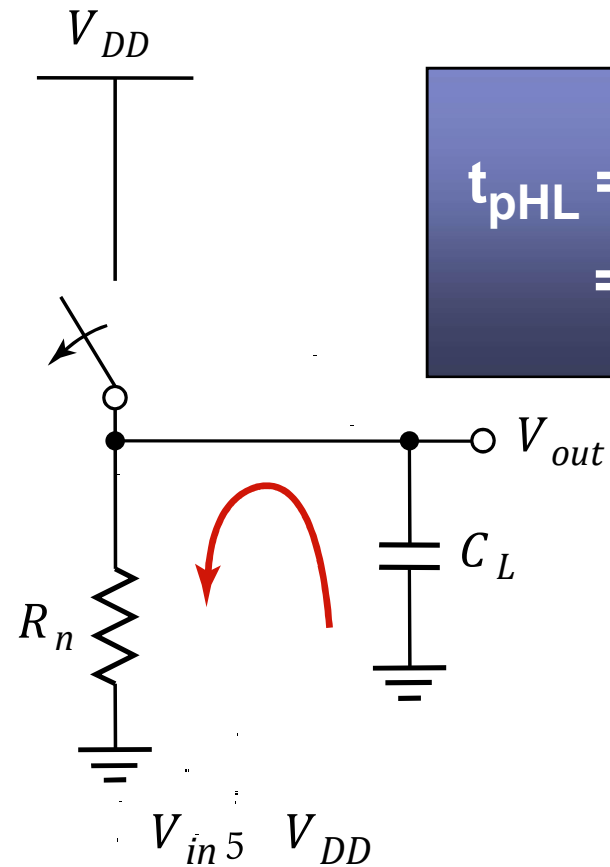


$$\begin{aligned} V_{OL} &= 0 \\ V_{OH} &= V_{DD} \\ V_M &= f(R_n, R_p) \end{aligned}$$

# CMOS Inverter: Transient Response



(a) Low-to-high



(b) High-to-low

$$t_{pHL} = f(R_{on} \cdot C_L) \\ = 0.69 R_{on} C_L$$